EPA/ROD/R03-99/131
1999

EPA Superfund
Record of Decision:

STRASBURG LANDFILL
EPA ID: PAD000441337
OU 04
NEWLIN TOWNSHIP, PA
09/27/1999

DRAFT *TFS 9/17/99*

Mr. Abraham Ferdas, Director
Hazardous Sites Cleanup Division
US EPA Region III
1650 Arch Street
Philadelphia

Re: Strasburg Landfill NPL Site
Newlin Township and West Bradford Township, Chester County
Record of Decision, Operable Unit 4
Letter of Concurrence

Dear Mr. Ferdas:

The Record of Decision (ROD) dated September, 1999, for Operable Unit 4 (OU 4), which pertains to groundwater at the Strasburg Landfill NPL Site (the Site), has been reviewed by the Commonwealth of Pennsylvania Department of Environmental Protection (Department).

The selected remedy for the Site includes the following major components, as specified in the selected remedy of the ROD:

1. This ROD, which is the fourth and final Record of Decision at this site, addresses the groundwater in and around the landfill area (OU 4). The first ROD (OU 1) addressed contaminated residential wells and leachate releases into surface water and groundwater near the landfill. Under the first action, leachate is now collected, treated, and discharged on site. The action for OU 1 has been fully implemented. The second ROD (OU 2) addressed site access and security. Under this action, the landfill portion of the Site has been enclosed by a security fence and additional warning signs have been posted. The third ROD addressed the landfill itself and the leachate emanating from it. The landfill has been regraded and capped with a multilayered impermeable cap.A new treatment plant has been constructed to treat the collected leachate. The treatment plant also treats landfill gases that are collected from an active venting system. The areas surrounding the Site have been regraded with topsoil and reseeded.

2. The alternative EPA has selected for this Site is an "No Action" alternative. Under this alternative, EPA plans to take no action beyond continued operation and maintenance of the first three remedies (OU 1, OU 2, and OU 3), as described above.

3. EPA will continue to monitor the groundwater at this Site by periodic sampling and analysis of selected on-site monitoring wells. Under this plan, EPA will conduct groundwater monitoring quarterly for the first two years, then monitor semi-annually for the following two years, and then annually for the next three years. EPA will evaluate the results of these monitoring events to confirm that this remedy and other remedial actions continue to support this no further remedial action decision.

4. Because hazardous substances remain on-site, reviews of the effectiveness of all remedial actions performed at this Site will be conducted at least every five years to confirm that the remedies remain protective of human health and the environment. These Five-Year Reviews will utilize the information gathered in the groundwater monitoring program, any necessary additional testing, and the leachate treatment plant discharge. Five-Year Reviews can also trigger further response actions if unacceptable risks are discovered or Site conditions change. Any significant increase in contaminant concentration in the groundwater would constitute a change in Site conditions and would trigger the immediate performance of a Five-Year Review, regardless of where the Site is in the standard five year timeframe.

The Department hereby concurs with the remedy selected for the Strasburg Landfill NPL Site OU 4 for the following reasons and with the following conditions:

Pennsylvania's Land Recycling and Environmental Remediation Standards Act, Act 2 of 1995, 35 P.S. §§6026.101 - 6029.909 ("Act2"), Pennsylvania's Solid Waste Management Act, Act 97 of 1980, as amended, 35 P.S. §§6018.101 *et. seq.* ("Act 97"), and the regulations adopted pursuant to these statutes are ARARs for this response. Implementation of any component or components of this response will not necessarily result in protection from liability pursuant to Act 2, for any party.

As the remedy purports to protect private drinking water wells in the area, the Five-Year Review should reevaluate the protectiveness of the remedy relative to these wells.

As the remedy purports to protect the stream quality of Briar Run, the Five-Year Review should reevaluate the protectiveness of the remedy relative to Briar Run.

Since the remedy is to be protective of Briar Run, and since Briar Run is mostly fed by groundwater, analytical sampling of Briar Run should be included in the groundwater sampling mentioned above as a major component of the remedy. This should be included as part of aforementioned component number three.

The Department reserves all its rights related to any future Remedial Design and Remedial Actions, to ensure compliance with Pennsylvania cleanup ARARs and design specific ARARs. This concurrence is also conditioned upon EPA providing the

Department notice and opportunity to participate in negotiations with potentially responsible parties.

This concurrence with the selected remedial actions is not intended to provide any assurance pursuant to CERCLA section 104(c)(3), 42 U.S.C. Section 9604(c)(3).

The Department reserves its rights and responsibilities to take independent enforcement actions pursuant to state and federal law.

This letter documents the Department's concurrence with the remedies selected by EPA in the ROD for OU 4 for the Strasburg Landfill NPL Site. If you have any questions regarding this matter, please feel free to contact me at the above telephone number.

Sincerely,

Joseph A. Feola
Regional Director
Southeast Regional Office

Cc: Mr. Fidler
Mr. Beitler
Mr. O'Neil
Mr. Crownover
Mr. Danyliw
Mr. Olewiler
Ms. Murphy
Mr. Hartzell
Mr. Sheehan
Ms. Tremont

RECORD OF DECISION
STRASBURG LANDFILL SITE
DECLARATION

SITE NAME AND LOCATION

Strasburg Landfill Site
West Bradford and Newlin Townships, Chester County, Pennsylvania

STATEMENT OF BASIS AND PURPOSE

This decision document is being issued by the United States Environmental Protection Agency (EPA) and presents the selected remedial action for Operable Unit Four (OU4) of the Strasburg Landfill Site (the Site). Operable Unit Four was initiated to investigate the groundwater contamination at the Site, evaluate the effectiveness of the three prior remedial actions, selected respectively in 1989, 1991, and 1992, and to determine the need for additional response actions. Note: the remedial action selected in 1992 superseded the remedial action selected in 1989. This current remedial action was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on information contained in the administrative record for this site.

The Commonwealth of Pennsylvania has concurred with the Selected Remedy set forth in this Record of Decision.

ASSESSMENT OF SITE

The Strasburg Landfill received both municipal and industrial wastes during its operation. The landfill served as a significant disposal site for municipalities in southeastern Pennsylvania as well as a disposal site for industrial contributors from this same area and from Delaware. It is estimated that the total volume of the landfill is at least 3,000,000 cubic yards of combined wastes and fill. Responses from industrial contributors to inquiries from EPA as to the substances deposited in the landfill characterize at least a portion of the waste as hazardous, as defined in 40 CFR § 261 Subpart C and 25 PA Code Part 261, Subpart C. These wastes, defined as "characteristic" under the Resource Conservation and Recovery Act (RCRA), were disposed of at the landfill after the effective date of RCRA. In addition some of the wastes deposited at the landfill contained constituents of hazardous wastes as defined in 40 CFR § 261 Subpart D and 25 PA Code Part 261, Subpart D. As part of the third operable unit, the landfill has been regraded to lessen the degree of steepness of the slopes. and an impermeable multi-layered cap has been constructed on the landfill. The landfill now resembles a large, grassy hill with gas

vents.

Significant reductions in groundwater contaminant levels have been observed since groundwater monitoring began in 1984. Upgrading the leachate collection system and initiation of activities involved in capping the landfill may have contributed to some of this reduction. Limited field testing also suggests that natural degradation of contaminants may also contribute to a lessening of concentrations in groundwater. All of the homes in the area rely upon private wells for water supply. They have all been included in groundwater monitoring programs conducted by the Pennsylvania Department of Environmental Protection (PADEP) and EPA.

A review of contaminant concentrations with time indicates a greater than 90% reduction in total volatile organic contaminants (VOCs) at residential wells R-5A and R-5B over a ten year period. Since an impervious barrier has been constructed on top of the landfill in 1998, measured contaminant concentrations in monitoring wells have remained below Maximum Contaminant Levels (MCLs). Contaminant concentrations in residential wells have remained below MCLs since 1995.

As discussed in the Summary of Site Risks section of this Record of Decision, the contaminated leachate is captured and treated by maintaining the landfill cap and leachate collection and treatment system. EPA's continued monitoring of these systems show that they have effectively eliminated exposure to contaminated groundwater.

The Risk Assessment also showed that there were no unacceptable current or potential human health risks from the reasonable maximum exposures to Site soils, ambient air, air stripper emissions, sediments, or surface waters. There have been no demonstrated or expected adverse impacts to environmental receptors.

DESCRIPTION OF THE SELECTED REMEDY: NO FURTHER ACTION

This operable Unit, OU4, is the fourth and final operable unit for this Site. The remedy selected for this operable unit is No Further Action beyond those implemented under EPA's three other decisions, and is the final planned action for the Site. Construction of the elements of the earlier remedies was completed in 1999 and continue to be implemented by EPA. These elements include: maintenance of a security fence around the landfill, operation and maintenance of an impermeable landfill cap system and associated leachate collection and treatment system with discharge to Briar Run, located east of the landfill. EPA will continue to maintain the fence, the landfill cap and collect and treat the landfill leachate. In addition, EPA will continue to monitor the groundwater through an extensive series of monitoring wells to assure that the site no longer poses a risk to the surrounding community.

EPA will monitor these wells on a quarterly basis for the next two years, then semi-annually for the following two years, and, at minimum annually for the next three years.

STATUTORY DETERMINATIONS

I hereby determine that the earlier remedies implemented at this Site have eliminated the need to conduct any additional remedial action. The remedies described in the 1991 and 1992 decisions remain protective of human health and the environment.

EPA has determined that its response at this Site is complete and no further action is necessary at this Site. Therefore, the Site now qualifies for inclusion on the Construction Completion List.

Because hazardous substances remain on-site above health-based levels, a review will be conducted by EPA within five years to ensure that the remedy continues to provide adequate protection of human health and the environment.

Abraham Ferdas, Director
Hazardous Site Cleanup Division
U.S. EPA, Region III

9/27/99
Date

RECORD OF DECISION
STRASBURG LANDFILL SITE
DECISION SUMMARY

1. Site Name, Location, and Description

The Strasburg Landfill Site (the "Site") is a portion of land, including a 24-acre inactive facility, located within a 302-acre tract of land south and slightly east of Strasburg Road in both Newlin and West Bradford Townships, Chester County, Pennsylvania. The coordinates of the Site are North 39E 56' 35" latitude and West 75E 46' 18" longitude. The entrance to the landfill is on Strasburg Road and is controlled by a locked gate. Approximately 1/4 of a mile up a dirt road from this gate is the landfill compound area; this area, approximately 45 acres of the property (the portion containing the 24 acre landfill), is enclosed by a cyclone fence with a number of locked gates. Access to the remaining 257 acres of the Site is essentially unrestricted (Fig 1). There have been three previous Records of Decision (RODs), designated as "Operable Units", issued for this Site. The ROD for "Operable Unit 1" ("OU1") was signed on June 29, 1989. That ROD called for the collection and treatment of the leachate from the eastern slope of the landfill. The ROD for OU2 was signed on June 28, 1991 and called for the installation of a perimeter fence around the landfill portion of the Site. The ROD for OU3 was signed on March. 30, 1992 and called for an impermeable cap to be placed over the entire landfill, and for all of the landfill leachate to be collected and treated prior to discharge. All of the work described under these first 3 RODs has been completed.

The topography of the area is characterized. by a combination of steep and gentle hills. All the land in the area is sloped towards, and drains to, the Brandywine Creek or toward Briar Run, one of the Brandywine's tributaries. These streams form the southern and western boundaries of the Site area.

The highest elevation of hills south of the Site area in Newlin Township approaches 550 feet above mean sea level (MSL). The landfill has been reconfigured as part of the third operable unit to resemble a large mound with gentle slopes. The peak elevation of the landfill, from ground control survey, is approximately 470 feet above MSL. (Note: EPA's measurements of the landfill height have indicated that the landfill shrinks approximately 12 inches per year). The south and east sides of the landfill have steeper and longer slopes than the north and western sides. The slope along the eastern side is approximately 25 degrees in some locations. Surface drainage from the Site flows to the south and southwest toward the Brandywine Creek and to the east and southeast toward Briar Run which flows into the Brandywine.

The elevation of the Brandywine Creek floodplain to the south is approximately 250 fleet above MSL. A small wetlands area has been created on the eastern side of the landfill along Briar Run. This wetlands area receives flow from Briar Run and flows back into Briar Run.

Land use in the area is primarily suburban residential, with some residual agricultural areas. There are approximately 300 single family residences within a one mile radius of the Site. All the drinking water to these residences is supplied from groundwater. Most of the homes are served by private home wells. There is a private water company, approximately one mile east and slightly north of the landfill, that provides drinking water from deep wells to a number of residences radiating away from the Site area.

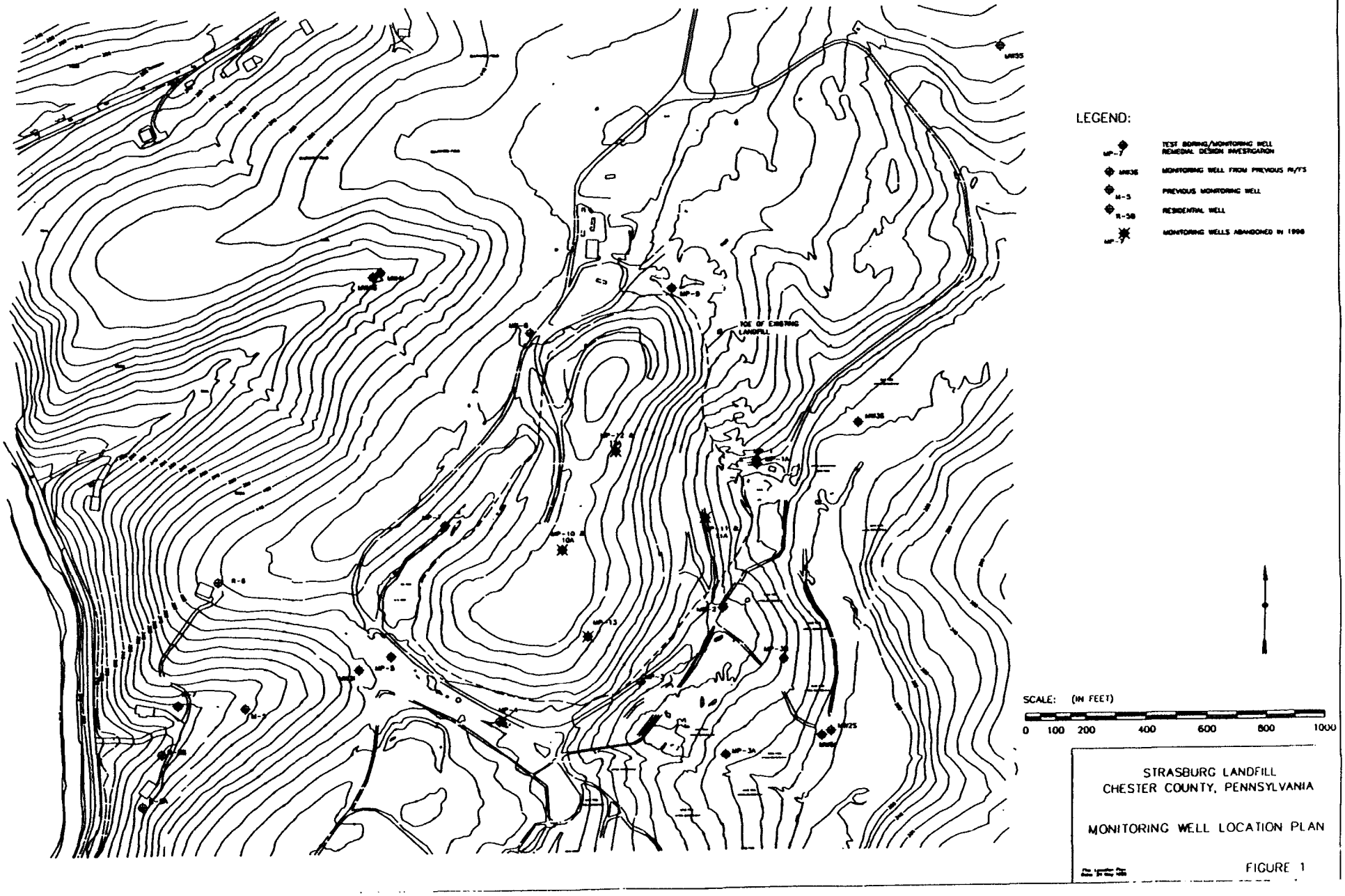
In 1996 EPA began recapping the landfill. All of the weeds, brush, and small trees, which had grown up on the landfill, were removed. The landfill was regraded to less steep slopes to conform with current landfill grading practices, and an impermeable liner was placed over the entire landfill area. Approximately 600,000 cubic yards of earthen material were placed on the landfill as part of this reconstruction. In addition, an active gas landfill system was installed which will assist in the waste digestive process occurring within the landfill by pulling air through the wastes encouraging breakdown of the landfill wastes. Also, a series of collection trenches were installed around the perimeter of the landfill so that any leachate emanating from the landfill could be collected. A new leachate treatment building has been erected which will treat all leachate from the landfill and discharge treated water to Briar Run in compliance with all existing regulations. This treatment plant is augmented by a new gas flare system which will safely destruct all gases developed in the landfill. This system became operational in September 1999.

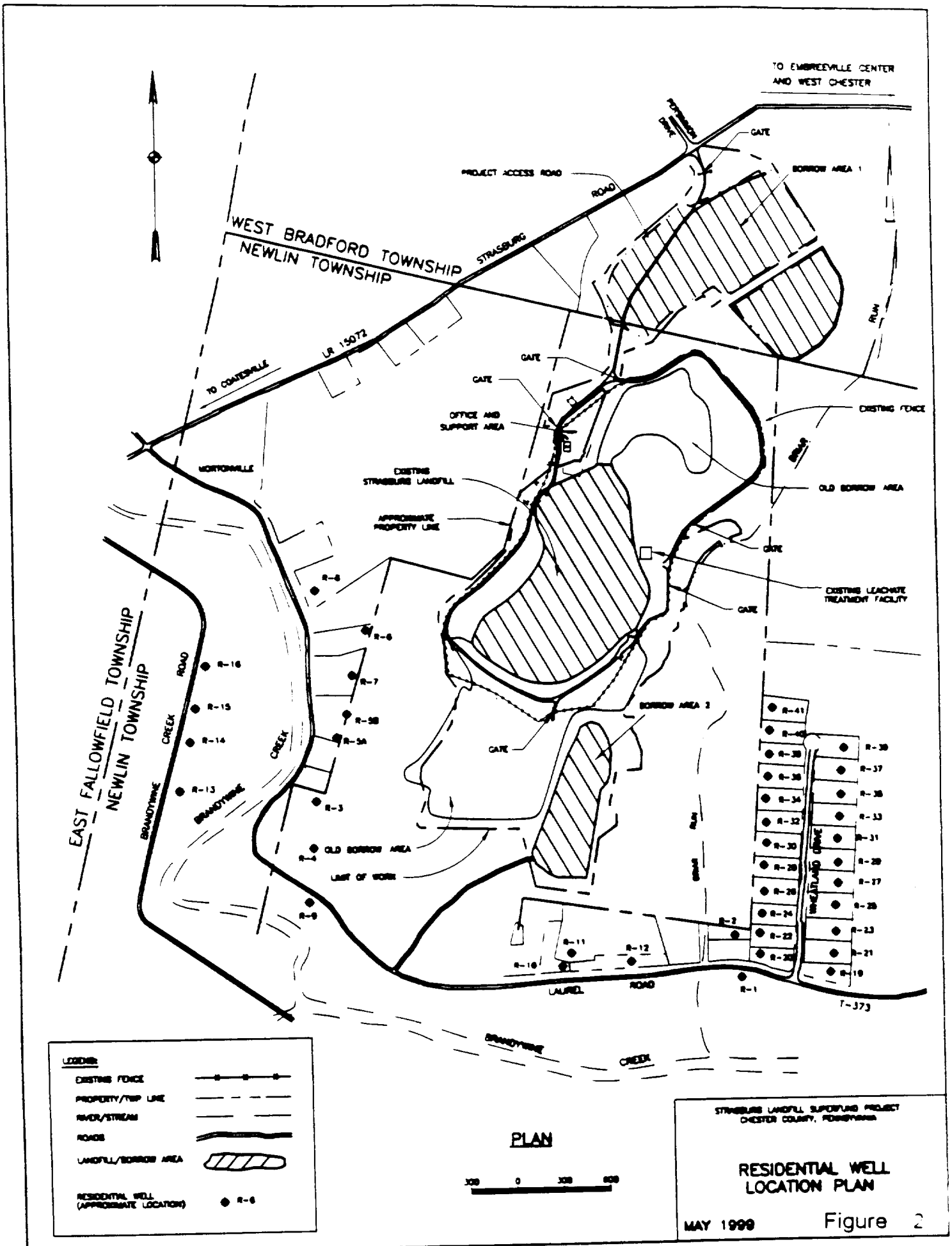
2. Site History and Enforcement Activities

According to EPA's records, prior to 1973 some of the property was used for farming and a large portion of the property was undeveloped.

A partnership, Strasburg Associates Inc. (SAI), was formed in September 1973 and purchased the property in December 1973. In August 1975, Strasburg Associates (SA) received a Pennsylvania Department of Environmental Resources (PADER), now known as Pennsylvania Department of Environmental Protection, permit to accept municipal wastes at the 24-acre facility. In May 1978, the Strasburg Landfill Associates (SLA) was formed through a joint venture agreement. In August 1978, SLA acquired the landfill. In October 1978, SLA applied to PADER for a proposed 200-acre landfill expansion. On October 11, 1978, SLA entered into a lease agreement with SAI, a joint venture composed of SAI and Strasburg Associates 11, (another limited partnership), to operate the landfill. The landfill opening was delayed until February 1979 because of local concerns over the use of residentially zoned roads, the proposed sale of the landfill to SLA, and permitting of a proposed 200 acre expansion.

In February 1979, the 24-acre landfill was opened. In the spring of 1979, new PADER permits were granted to SLA to receive certain industrial and heavy metal wastes. By July 1971). the landfill was accepting sewage treatment plant sludge and manufacturing wastes, including “off-spec”(containing higher than acceptable concentrations of vinyl chloride monomer) and scrap PVC. By December 1979, more than 1,000 cubic yards of PVC wastes, 2,052 cubic yards


LEGEND:
TEST BORING/MONITORING WELL REMEDIAL DESIGN INVESTIGATION
MONITORING WELL FROM PREVIOUS RI/FS
PREVIOUS MONITORING WELL
RESIDENTIAL WELL
MONITORING WELLS ABANDONED IN 1998
TOE OF EXISTING LANDFILL
SCALE: (IN FEET)
0 100 200 400 600 800 1000
STRASBURG LANDFILL
CHESTER COUNTY, PENNSYLVANIA
MONITORING WELL LOCATION PLAN
FIGURE 1


TO EMBREEVILLE CENTER AND WEST CHESTER
GATE
PROJECT ACCESS ROAD
BORROW AREA 1
WEST BRADFORD TOWNSHIP
NEWLIN TOWNSHIP
STRASBURG
ROAD
RUN
TO COATESVILLE
LR 15072
GATE
GATE
OFFICE AND SUPPORT AREA
EXISTING FENCE
MORTONVILLE
EXISTING STRASBURG LANDFILL
OLD BORROW AREA
APPROXIMATE PROPERTY LINE
GATE
EXISTING LEACHATE TREATMENT FACILITY
GATE
EAST FALLOWFIELD TOWNSHIP
NEWLIN TOWNSHIP
BRANDYWINE CREEK ROAD
BRANDYWINE CREEK
R-16
R-15
R-14
R-13
R-8
R-6
R-7
R-5B
R-5A
R-3
R-4
R-9
OLD BORROW AREA
LIMIT OF WORK
BORROW AREA 2
GATE
R-41
R-40
R-39
R-38
R-37
R-36
R-35
R-34
R-33
R-32
R-31
R-30
R-29
R-28
R-27
R-26
R-25
R-24
R-23
R-22
R-21
R-20
R-19
R-2
R-11
R-12
R-10
R-1
LAUREL ROAD
T-373
BRANDYWINE CREEK
LEGEND
EXISTING FENCE
PROPERTY/TWP LINE
RIVER/STREAM
ROADS
LANDFILL/BORROW AREA
RESIDENTIAL WELL (APPROXIMATE LOCATION)
R-6
PLAN
300 0 300 600
STRASBURG LANDFILL SUPERFUND PROJECT
CHESTER COUNTY, PENNSYLVANIA
RESIDENTIAL WELL LOCATION PLAN
MAY 1999
Figure 2

of industrial wastes and sludges, and 35,000 gallons of heavy metal sludge had been accepted at the landfill.

In December 1979, PADER charged the landfill operators with excessive siltation of Briar Run. At that time PADER prohibited the disposal of certain industrial wastes because the waste characteristics did not match those on the approved waste disposal application module. Also, PADER prohibited SLA from accepting additional PVC waste for disposal. In August 1980, PADER permanently prohibited the landfill from receiving industrial wastes. Between January and June 1981, PADER cited SLA for operational problems (dust control, daily cover, and litter control) at the landfill.

PADER conducted periodic inspections, both announced and unannounced, during the landfill operation. During an unannounced inspection in April 1983, PADER found four major operating violations: improper run-off control, slopes in excess of allowed limits, failure to cover compacted waste, and inadequate sedimentation and erosion control. PADER issued SA a notice of violation and required that the violations be corrected within 30 days. The violations were not corrected within the specified time. In May 1983 PADER suspended the landfill operating permit and ordered the landfill closed. SLA closed the landfill in May 1983, by providing a final soil cover, a PVC cover, and stabilizing the Site with an additional layer of soil. The operators also planted vegetation and installed a leachate storage tank system. PADER also issued an order requiring the removal of collected leachate for off-site treatment and disposal.

As part of the closure plan, the landfill was supposed to be regraded, covered with 2 feet of soil, and topped with a PVC cover. Another 2 feet of soil was supposed to be placed on the PVC cover and vegetation planted. After the vegetation took root, the cap was to be maintained by mowing. These actions did not occur. The landfill PVC liner was not covered with two feet of soil, and, in numerous locations, the liner was exposed to sunlight. The operators did install a leachate collection and storage system as part of the closure plan, however, it is not clear how extensive, or how well, this system was installed. Starting in 1987, EPA performed additional work to channel some of the landfill leachate into the treatment system constructed as part of OU1.

In August 1983, volatile organic contaminants were detected in an on-site monitoring well, (identified as M-2 on figure 1), and in the landfill witness system drain pipes. In September 1983, volatile organic contaminants were detected in Briar Run east of the landfill. PADER required SA and SLA to conduct a periodic monitoring program and a hydrogeologic study. In October 1983, volatile organic contaminants, in excess of drinking water standards, were detected in an off-site residential drinking water well southwest of the landfill.

In February 1984, SLA installed four monitoring wells (figure 1 - M-2A, M-2B, M-2C, and M-5) and began a sampling and analysis program. SLA submitted the hydrogeologic investigation to PADER in July 1984. Also, in July 1984, SLA completed the hydrogeologic/engineering report which evaluated the extent of groundwater contamination. This report delineated six corrective measures for the landfill operation:

o Extending the PVC liner;
o Installing new leachate collector drains;
o Installing a 15 mil PVC membrane cap;
o Regrading soil to attain 2-1/2:1 or 3:1 final outslopes;
o Revegetating the sides and the top of the landfill, and
o Regrading soil to divert surface water away from the fill.

Implementation of these measures was never completed. Additionally, the eastern side of the landfill was very steep (estimated 60% slope) in areas, and erosion occurred such that the original PVC liner was exposed and torn in numerous locations. Vegetation was non-existent or extremely sparse over approximately 1/3 of the landfill. More than 20 distinct leachate seeps developed over much of the sloped areas of the landfill. Because of the lack of cap maintenance and the toxic effect of the leachate seeps on the extant vegetation, erosion began to rapidly accelerate the demise of the already poor landfill cap.

PADEP (in conjunction with EPA) had conducted periodic monitoring of residential drinking water wells, from September 1983 to the present (see Appendix A of the Focused Groundwater Investigation). The initial monitoring program results from the 1980s showed two residential wells southwest of the landfill contaminated with volatile organics. In August 1983, PADER analyses of water from well M2 and of leachate from the witness drain revealed organic and inorganic contamination. In September 1983, analyses of water samples collected from well M2, the witness drain, and Briar Run revealed significant levels of organic chemicals.

EPA prepared a Hazard Ranking System (HRS) scoring package for the Strasburg Landfill Site in April 1987, and the Site received a score of 30.71. The Site was proposed for inclusion on the National Priorities List (NPL) in Update Number 7, released in June 1988. The Strasburg Landfill was added to the NPL in March 1989.

As a result of the leachate running off of the landfill and flowing directly into Briar Run, and the failure of the operator to take any corrective actions, PADER initiated an action to collect the leachate and haul it for treatment at a nearby municipal sewage treatment plant. Prior to the installation of the leachate collection system and treatment system, surface water runoff and leachate from the landfill were directed into the unlined sediment ponds located southwest and east of the landfill. During the period from the fall of 1991 through the summer of 1998 it is estimated that the leachate flow fluctuated seasonally from an approximate low of 5 gallons per minute in late summer to a high of 15 gallons per minute in mid-spring. Since the impervious liner was placed on the landfill in July 1998, leachate flows have dropped to less than 2 gallons per minute.

Recreational uses of the landfill property, such as ATV, horse riding, and hunting (all of which are detrimental to the protection of the cap), have been significantly reduced by the construction activities associated with OUs 2 and 3, specifically the erection of the 8 foot high fence around the landfill and the daily presence of approximately 100 construction workers. On-site construction workers have been diligent in warning local residents about the dangers

associated with the Site; however, the local residents, particularly adolescents, have been persistent in attempting to access the property for recreational purposes.

A number of Potentially Responsible Parties (PRPs) have been notified with regard to remedial actions undertaken at the Site. A group of PRPs performed the OU 1 collection and treatment for the period of time from late 1990 until late 1997 when that function was superseded by the remedial work performed as part of OU 3. In addition, EPA has reached settlements with a number of PR-Ps for the recovery of a portion of the United States' past costs. Past costs include monies spent by EPA in performing investigative and design studies as well as construction costs for the fence and the new impermeable landfill cap.

3. Highlights of Community Participation

The Focused Groundwater Investigation Report as well as other information referred to in this Record of Decision (ROD) can be found in the Administrative Record compiled for this Site. The Administrative Record is available for inspection at the public information repository located at:

Bayard Taylor Memorial Library
Kennett Square, PA.
216 East State Street
Kennett Square, PA 19348
(610) 444-2702

A copy of the Administrative Record is also available at the EPA Region III Office and can be reviewed by appointment arranged with the EPA representative named below:

Anna Butch
Administrative Record Coordinator
U.S. EPA, Region III
1650 Arch Street
Philadelphia, PA 19103-2029
(215) 814-3157

EPA encourages the public to review these collected documents in order to get a better understanding of the Site and the Superfund activities that have been conducted there.

On July 14, 1999 EPA issued its Preferred "No Action" Alternative for this Site in the Proposed Plan which became part of the Administrative Record. EPA solicited input from the community in a formal public comment period for the Proposed Plan, which was initiated Julv 14, 1999 and closed August 13, 1999. A fact sheet describing the Site, the comment period. and the decision making process was mailed to local residents, local officials, and to other interested parties. A public meeting was held on the evening of July 26, 1999 at the West Bradford

Township Building. At this meeting representatives from EPA and PADEP answered questions about problems at the Site and the remedial alternatives under consideration. A response to the comments received during the public comment period is included in the Responsiveness Summary, which is part of this ROD.

This Record of Decision is intended to address the last remaining potential threats to human health and the environment posed by this Site via groundwater.

This decision document presents the selected remedial action for OU4 for the Strasburg Landfill Site, in Newlin and West Bradford Townships, Pennsylvania, chosen in accordance with CERCLA, as amended by SARA, 42 U.S.C §§ 9601-75, and to the extent practicable, the National Contingency Plan, 40 C.F.R. Part 300. The decision for this Site is based on the Administrative Record.

4. Scope and Role of Operable Unit (OU 4) or Response Action Within Site Strategy

As with many Superfund sites, managing the problems at the Strasburg Landfill Site are complex. As a result, EPA has organized the Site work into four separate actions.

This ROD, which is the fourth and final record of decision at the Site, addresses the groundwater in and around the landfill area (OU 4). The first ROD (OU 1) addressed contaminated residential wells and leachate releases into surface water ways and groundwater near the landfill. Under this first action, leachate is now collected, treated, and discharged on-site. The action for OU 1 has been fully implemented. The second ROD (OU 2) addressed Site access and security. Under this subsequent action, the landfill portion of the Site was enclosed by a security fence and additional warning signs were posted. The third ROD addressed the landfill itself and the leachate emanating from it. The landfill has been regraded and capped with a multilayered impermeable cap, a series of intercepting trenches were installed to collect any leachate flowing out of the landfill, and a new treatment plant has been erected to treat the collected leachate along with, in a separate treatment train, all of the gases emanating from the landfill. Much of the surrounding areas of the Site have been regraded with topsoil and these areas reseeded.

This action (OU 4) addresses groundwater contamination. It is based on groundwater modeling and data collected since OU 3 was initiated in March 1992.

5. Nature and Extent of Contamination

This section focuses on the contaminants that may pose hazards, through ingestion, inhalation, and direct contact, to the public due to the release of hazardous substances from the landfill. The Strasburg Landfill received both municipal and industrial wastes during its operation. The landfill served as a significant disposal site for municipalities in southeastern Pennsylvania as well as a disposal site for industrial contributors from this same area as well as

from Delaware. It is estimated that the total volume of the landfill is at least 3,000,000 cubic yards of combined wastes and fill. The proportion of industrial waste to municipal waste has not been determined. Responses from industrial contributors to inquiries from EPA as to the substances deposited in the landfill characterize, at least a portion of the waste as hazardous, as defined in 40 CFR § 261 Subpart C and 25 PA Code Pan 261, Subpart C. These wastes, defined as "characteristic" under the Resource Conservation and Recovery Act (RCRA), were disposed of at the landfill after the effective date of RCRA. In addition, some of the wastes deposited at the landfill contained constituents of hazardous wastes as contained in 40 CFR § 261 Subpart D and 25 PA Code Part 261, Subpart D.

In the years 1990 through 1992 EPA inspectors observed that the plastic liner on the landfill, which was supposed to be buried under two feet of soil, was exposed to the surface. The number of locations where the liner was exposed exceeded 25 and, based on further examination by EPA, it was estimated that a significant portion of the landfill had only a few inches of soil cover. In addition, leachate streams flowed from a number of areas on the landfill which had been improperly capped or where the landfill cap had been somehow compromised. Initial overflights of the Site conducted in 1991 by EPA showed approximately 15 leachate seeps on the eastern and southern slopes of the landfill. In 1993, EPA identified at least six additional new seeps on the southern and western portions of the landfill. It is not clear if these were new seeps or if they had been overlooked during the over-flight investigation. Leachate, as used in this document, refers to the liquid and semi-liquid substances, particularly hazardous chemicals, that seep from the contents of the landfill, either onto other ground surface areas and/or into groundwater (called "discharge to groundwater"), or surface waters.

As part of the landfill closure (according to the closure plan), the cell structure of the landfill was to be vented by gas vent pipes to allow for the escape of built-up landfill gases. The vent pipes were to be placed at reasonable distances to allow the gases to escape, and the landfill liner was supposed to be covered with clean soil. Two feet of soil was specified to be placed on top of the liner, and, as a final measure, the surface was to be seeded to promote the growth of vegetation to prevent soil erosion. In the situation at the Strasburg Landfill, as described above, the depth of soil cap was totally inadequate, with much of the liner exposed and torn. In addition, the type of soil used for final cover was inappropriate. Much of the liner cover material was best described as weathered bedrock, which is a poor soil base for subsequent vegetation. More importantly, this weathered bedrock contained numerous jagged rocks, many over 8 inches in diameter, which, when dropped from the tailgate of a dump truck, punctured the fragile plastic liner. The resulting effect was that the original liner more closely resembled (in effect) an inverted colander, allowing rain water to flow freely into the landfill and leachate to flow freely out of it. Most of the leachate seep material that rose to the landfill surface flowed to the eastern and southern direction toward a small trout stream called Briar Run which, from this point, flows approximately one quarter mile before it joins the Brandywine Creek, which is classified as a scenic stream. In addition, there is a drinking water intake located in the Brandywine less than two miles downstream from the Site. The neighborhood around the landfill is relatively stable and consists mostly of single middle class family housing. There is a considerable amount of new single home development as close as 1/4 mile from the Site.

6. Site Characteristics

The Landfill

The Strasburg Landfill received both municipal and industrial wastes during its operation. The landfill served as a significant disposal site for municipalities in southeastern Pennsylvania as well as a disposal site for industrial contributors from this same area and from Delaware. It is estimated that the total volume of the landfill is at least 3,000,000 cubic yards of combined wastes and fill. Responses from industrial contributors to inquiries from EPA as to the substances deposited in the landfill characterize at least a portion of the waste as hazardous, as defined in 40 CFR § 261 Subpart C and 25 PA Code Part 261, Subpart C. These wastes, defined as "characteristic" under the Resource Conservation and Recovery Act (RCRA), were disposed of at the landfill after the effective date of RCRA. In addition some of the wastes deposited at the landfill contained constituents of hazardous wastes as contained in 40 CFR § 261 Subpart D and 25 PA Code Part 261, Subpart D. As part of the third operable unit the landfill has been regraded to lessen the degree of steepness of the slopes and, an impermeable multi-layered cap has been constructed on the landfill. The landfill now resembles a large, grassy hill with gas vents.

Groundwater

Significant reductions in groundwater contaminant levels have been observed since groundwater monitoring began in 1984. Upgrading the leachate collection system and initiation of activities involved in capping the landfill may have contributed to some of this reduction. Limited field testing also suggests that natural degradation of contaminants may also contribute to a lessening of concentrations in groundwater.

Hydrogeologic Setting

The Site lies within the Piedmont Lowland section of the Piedmont Physiographic Province, a region of low to moderate relief and broad, gently rolling hills and valleys. The Site is underlain by weathered bedrock which grades into consolidated rock. Bedrock units in the vicinity of the Site include the Wissahickon schist, the Peters Creek schist, as well as small areas of diabase, serpentenite and pegmatite. All of these bedrock units are fractured in nature. Groundwater is stored in the weathered unit and in bedrock fractures. The zone of highest permeability is found at the contact between the weathered and consolidated rock. Permeability and storage capacity generally decrease with depth as the degree of weathering decreases. The general direction of groundwater movement at the Site is to the south, southwest, and southeast primarily. Regional fracturing is primarily responsible for the flow directions. All of the homes in the area rely exclusively upon groundwater for water supply. They have all been included in groundwater monitoring programs conducted by PADEP and EPA.

Groundwater Sampling

Remedial Investigations were limited to obtaining additional rounds of sampling from monitoring and residential wells and performance of limited natural attenuation testing at selected monitoring wells. Sampling results are contained in the June 1999 Focused Groundwater Investigation Report. Monitoring data included results from the Spring and Fall of 1994, and quarterly monitoring from February 1998 through March 1999. Residential welt data were obtained from both EPA and PADEP sources commencing in 1983. Limited natural attenuation testing, performed for informational purposes only, were obtained in May 1999 to determine if the contaminants measured from the landfill were chemical breakdown products of other contaminants placed in the landfill.

Contaminant Migration

Historically, the highest levels of contamination were found at monitoring well MP-3, at the southeast portion of the landfill. Evaluation of contaminant concentrations with time have indicated that contamination in this well have been reduced by one-half from 1994 to 1999. Additionally, contaminant levels diminish quickly as the contaminants migrate to the southeast. Contaminant levels in monitoring wells 2S and 5I, directly downgradient of MP-3, which historically have had low to trace levels of cis-1,2-dichloroethene, were “non-detected” during the Spring 1999 sampling.

Contamination southwest of the landfill is concentrated along a swale that occurs from monitoring well MP-5 to residential well R-5B (figure 1). Contaminant levels are lower than at MP-3. Historically, contamination has occurred above Maximum Contaminant Levels (MCLs) at residential wells R-5A and R-5B. The contamination in this area likely discharges to Brandywine Creek, where it is quickly diluted. A review of contaminant concentrations over an approximate 10 year period of time, indicate a greater than 90% reduction in total VOCs at residential wells R-5A and R-5B. Since an impervious barrier was constructed on top of the landfill in 1998, measured contaminant concentrations in monitoring wells have remained below MCLs. Contaminant concentrations in residential wells have remained below MCLs since 1995

7. Summary of Site Risks

The Strasburg Landfill contains approximately 2.4 million cubic yards of fill material. Most of this material is domestic wastes from local communities. While no historical landfill records have been produced, EPA has determined that a small portion of the wastes taken to this landfill contained hazardous substances. These hazardous substances included chromium, nickel, trichloromethene, benzene, and vinyl chloride. Monitoring conducted by EPA over the past 13 years has shown that initially some of these hazardous substances migrated into the groundwater and were detected in two residential home wells. EPA also measured some of these same contaminants in some of the on-site monitoring wells. As the years passed, and as EPA performed remedial actions at this Site, the measured concentrations of these contaminants

decreased. Initially EPA analyzed the groundwater samples for over 80 different hazardous compounds. Virtually all of these analyses showed that only about 8 of these compounds were ever measured at levels above the detection limits of the analytical instrumentation. As the years passed, EPA pared the list of screened compounds down to approximately 33 and, for approximately the past six years, 90% of these contaminants monitored for both residential and on-site monitoring wells have not been detected. A few compounds, like benzene and vinyl chloride, have been detected, but almost always within EPA's Drinking Water Standard "MCLs". In those rare instances where an accedence has occurred, it has been an isolated detection, and not coupled with detections of other contaminants. For example, vinyl chloride was detected in monitoring well MW-31 at 3 µg/l (the MCLS for vinyl chloride is 2 µg/l) in March 1999 and has not been detected in this well before or since. The sporadic and low levels detected pose no significant risk to human health and the environment, even for prolonged exposure.

Other routes of exposure such as to air, Site soil, and surface water, have been addressed by previous remedial actions performed by EPA at this Site. As a result of EPA's remedial actions, the Site no longer poses a risk to human health or the environment.

8. Description of the Selected Remedy - No Action

The alternative EPA has selected for this Site is "No Action". Under this alternative, EPA plans to take no action beyond continued operation and maintenance of the first three remedies (described above). EPA will continue to monitor the groundwater at this Site by periodic sampling and analyses of selected on-site monitoring wells. Under this plan, EPA will conduct groundwater monitoring quarterly for the first two years, monitor semi-annually for the following two years, and then annually for the next three years. EPA will evaluate the results of these monitoring events to confirm that the earlier remedial actions continue to support this "no action" decision.

Because hazardous substances remain on-site, reviews of the effectiveness of all remedial actions performed at this Site will be conducted at least every five years to confirm that the remedies remain protective of human health and the environment. These Five-Year Reviews will utilize the information gathered in the groundwater monitoring program, and any necessary additional testing which would, at a minimum, include air monitoring around the Site air stripper and the results of the leachate treatment plant discharge. Five-Year Reviews can also trigger further response actions if unacceptable risks are discovered or Site conditions change. Any significant increase in contaminant concentration in the continued groundwater monitoring would constitute a change in Site conditions and would trigger the immediate performance of a Five-Year Review, regardless of where the Site is in the standard five year time frame.

9. Basis for the No Action Alternative

A determination that "No Action" or "No Further Action" is required, takes into account reasonable maximum exposure and the attendant risks. At the Strasburg Superfund Site, the past Remedial Investigations and Risk Assessments along with the current Focused Groundwater

Investigation Report have demonstrated that there are no unacceptable risks to human health or the environment.

As discussed in the Summary of Site Risks section of this Record of Decision, the contaminated leachate is captured and treated by maintaining the landfill cap and leachate collection and treatment system. EPA's continued monitoring of these systems shows that they have effectively eliminated exposure to contaminated groundwater.

The Risk Assessment also showed that there were no unacceptable current or potential human health risks from the reasonable maximum exposures to Site soils, ambient air, air stripper emissions, sediments or surface waters. There have been no demonstrated or expected adverse impacts to environmental receptors.

10. Documentation of Significant Changes from Proposed Plan

As discussed in Section III, Highlights of Community Participation, EPA issued its Proposed Plan for this Site on July 14, 1999. The Proposed Plan identified No Further Action as EPA's Preferred Alternative. EPA solicited input from the community in a formal public comment period for the Proposed Plan, which was initiated July 14, 1999 and closed August 13, 1999. After review of all written and oral comments, EPA determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary. All of the major and significant public comments to the proposed, remedy that EPA received during the comment period are summarized and addressed in the **Responsiveness Summary** which is included as Attachment 2 of this ROD. As necessary, some specific responses and additional information were sent to individual commenters.

Strasburg Landfill - Responsiveness Summary

The following questions (with responses) are all taken from the Public Meeting held on July 26, 1999 at the West Bradford Township Building, Chester County, Pennsylvania. The public comment for this proposed remedy ran from July 14, 1999 until August 13, 1999. No other comments, either written or verbal, were received concerning this proposal during the comment period.

Comment: Several neighboring residents expressed requests to continue to have their home well water sampled and analyzed.

EPA Response: Both EPA and the Pennsylvania Department of Environmental Protection (PADEP) have sampled residential home wells in the vicinity of the landfill on a regular basis for a period exceeding 13 years. During this period EPA has installed a network of over 30 monitoring wells around the landfill to monitor contaminants in groundwater before they would reach residential boundaries. All of this data showed that only one home ever exhibited contaminant concentration levels above action levels and that, for at least, the last six years, even this residences well water has tested as containing no contaminants above Maximum Concentration Levels as set forth in the Clean Water Act. EPA has committed to continue to monitor the monitoring wells around the Site, which serve as "early warning sentinels", on a scheduled periodic basis. EPA feels that the residents are better protected from potential contamination from the landfill by monitoring well analyses than any other protocol. EPA advises residents that if they still feel uncomfortable that they may seek to have their own water tested and analyzed and EPA is committed to advise them as to which parameters they may want to look for.

Comment: Is EPA still sampling the residential well water of residences supplied with home well filters prior to the carbon filtration systems?

EPA Response: At the Strasburg Landfill Site EPA installed whole house filtration systems on two home wells in 1989. These systems were installed with the capability of monitoring the well water both before and after the carbon filter units. As a matter of protocol both EPA and PADEP have routinely sampled these residential wells both before and after the filtration units. EPA has committed to maintain these filter units as a safeguard measure for at least the next several years, even though past data has shown that the well water is safe to drink without any filtration. Because of the installation of the monitoring well system, EPA, as a matter of course. will no longer be sampling residential home wells.

Comment: Is it possible for contamination to flow to residential wells without being detected by the monitoring wells.

EPA Response: The remedial actions previously taken by EPA make it highly unlikely that any contamination will leave the landfill. The landfill is now totally capped with an impervious liner and any leachate is collected and treated far away from any residences. Should any leachate

escape these collection devices, it would most likely be detected in the network of monitoring wells surrounding the landfill long before it would reach any residential wells. Should such a breakthrough occur and be detected, EPA would take immediate action (such as the installation of additional home well filters and/or the pumping and treating of contaminated groundwater to insure that nearby residences remain protected.

Comment: I would like my home well filter changed out.

EPA Response: This request was made by one of the two home owners whose home well is being maintained on a home well filtration system. Even though the filters were scheduled to be replaced in September, 1999, these filters were replaced within 10 days of this request.

Comment: I would like my home well filter system continued as a part of landfill maintenance.

EPA Response: EPA has agreed to maintain these two home well filter systems for, at least, the next several years. EPA will review the need for continuing these filter systems on a periodic basis. At the point that EPA determines that the filters are no longer needed, EPA will notify the residents of its intention.

Comment: I would like a direct phone number to get my filters replaced.

EPA Response: Currently the home well filters are being maintained by EPA through a contract with the US Army Corps of Engineers (USAGE). Currently, the USAGE point of contact for this contract is Ed Yakuchev and his direct phone number is (410) 962 - 6727. Since EPA is responsible for maintaining this filtration system, it is recommended that these residents continue to deal with EPA's designated Remedial Project Manager for this Site, currently James P. Harper; and his phone number is (215) 814 - 3197.

Comment: What does maintenance of the landfill include?

EPA Response: All of the maintenance items described below have been previously described in detail in decision documents for other operable units for this Site. Under a contract with PADEP, EPA will continue to perform all maintenance work associated with the Site for a period of one year. After this one year period all of the operations and maintenance associated with this Site will be performed by PADEP. This work consists of the following:
- maintenance of the gates and fencing surrounding the landfill,
- maintaining the grassy cover on the landfill, including cutting the grass, repairing, as needed, any erosion cuts or bare spots on the landfill surface,
- operating and maintaining the landfill vent gas system including the blowers, gas vaults, vent piping, and gas flare system,
- maintaining all aspects of the new leachate treatment building, including the building itself. operating and maintaining the leachate collection and treatment system, including the collection trenches, all the collection and holding tanks, the piping, and treatment units located in and around the new treatment building, and the discharge piping to the receiving stream.

- sampling and analyzing the discharge water from the treatment process to insure compliance with the NPDES
- collecting, sampling, and shipping off-site for appropriate disposal all leachate filter cake and related solids from the treatment process.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

SUBJECT: Record of Decision - Transmittal Memo

FROM: Peter W. Schaul, Chief
Remedial Branch (3 HS 20)

TO: Abraham Ferdas, Director
Hazardous Site Cleanup Division (3 HS 00)

Attached is the Record of Decision (ROD) for the Strasburg Landfill Superfund site. This decision outlines a "no action" remedy for OU 4 for the Site.

There are no changes from the Proposed Plan to this ROD. I recommend that you sign the attached document. The Commonwealth of Pennsylvania has concurred with this decision, we have not as yet received written concurrence.